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Contribution by UNU-EHS

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all: a solution by science, technology and innovation”

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<p><b>Questions</b></p>	<p><b>Projects/Contact person</b></p>
<p>1. Can you give examples of projects/policies in your organization helping countries improve the management of water and sanitation and provide access to safe water and sanitation for all? What are the main challenges confronted (including the gender dimension) while trying to implement these projects/policies?</p>	<p>Youth and Women Green Entrepreneurship in Africa (YW-GSE) project aims at setting up a framework that brings together actors and stakeholders of the green innovation and entrepreneurship ecosystem in Africa to identify and ideate solutions, organize and support innovations, innovators and entrepreneurs with a focus on women and youth. The framework builds on the result of the analysis, assessment and classification of African start-ups, innovations and promising market segments and the mapping of actors and stakeholders and structure of the Green Innovation and Entrepreneurship Ecosystem in five green sectors namely renewable energy, water management, smart agriculture, climate actions and waste management. Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu)</p>

Frugal Innovation and Entrepreneurship in Water 4.0 in Africa (FIUWA) project is a research and design project that aims at the identification of water sector challenges in Southern Africa and specifically in Namibia, Angola and South Africa while also analyzing existing and potential technologies, innovations and interventions that may contribute to address these challenges. The project will also identify key stakeholders in Africa that are involved in the water sector and the technologies, innovations and entrepreneurship space and organize them into a water sector innovation ecosystem, develop conceptual structures for an ideation and open innovation process, as well as for capacity building, and venture and acceleration programs. The project faces a challenge of how to secure funding to support innovation activities (especially seed funding for innovators in the water sector) since the current funding mainly supports research and development activities. Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu)

AquaMount project aims to improve water management and water scarcity conditions in the semi-urban region of QwaQwa, South Africa. A second project investigates drivers of land degradation at a watershed level, where degradation is impacting water supply and quality across the Lesotho/South Africa border. While working on the QwaQwa case study in South Africa, a former homeland under Apartheid, we were faced with the challenge of understanding the complex societal dynamics and inequalities resulting from systematic racial segregation, particularly how this manifested in difficulties in urban planning, and thus in accessing and managing water. We found that the co-existence of formal and informal levels of governance, and the lack of coordination between the two systems, has significant negative consequences on the water infrastructure management and maintenance. Moreover, we were challenged by the lack of existing quantitative data to explore and analyse biophysical and socio-economic

conditions related to water scarcity. Contact persons: Dr. Schneiderbauer Stefan (email:schneiderbauer@ehs.unu.edu), Ms. Jess Delves (delves@ehs.unu.edu) and Dr Stefano Terzi (terzi@ehs.unu.edu).

Agrophotovoltaics for Mali and The Gambia (APV-MaGa) Project aims at establishing Agrophotovoltaics (APV) as a sustainable energy system that provides food, water and electricity to the local population while increasing resilience of the agriculture sector against climate change. The main challenge confronted so far is the preparation of the ground for the installation of the agrophotovoltaic system. The challenges ranges from getting the permissions, seeking services of legal practitioners locally to intepret laws of the country with respect to the project, respecting the funding guidelines which does not match one-on-one with the reality of the project, designing a sustainable business model in an environment where there is not previous experience or data, lack of capacity, the lack of equipment and materials, the lack of infrastrcture e.g road etc. Contact person: Dr Ambe Emmanuel Cheo (email: cheo@vie.unu.edu).

RETO-DOSSO project demonstrates that a solar system improves water, electricity and food supply. Through the project, a pilot solar system will be installed at a village school in Niger in the Dosso region to power a groundwater pump with drinking water treatment, support irrigation and provide electricity. Within RETO-DOSSO project, UNU-EHS leads the assessment of climate change impacts and adaptation measures to inform sustainable design and implementation of water, energy, and food (WEF) security interventions under current and future climatic conditions in Niger. The main challenges are relate to COVID-19 disruptions of travel to project country, insecurity concerns in project country, how to ensure gender balance in project activities e.g., workshops and surveys. Contact person: Mr. Paul Nduhuura (email: Nduhuura@vie.unu.edu)

<p>2. Could you share specific examples that have successfully used STI, including frontier technologies (e.g., AI, drones, etc) or other forms of innovation in general in addressing the above challenges?</p>	<p>The YW-GSE project will provide: i) capacity building programmes; ii) linkages to incubation support services with access to technical facilities to test, demonstrate and deploy ideas, prototypes, and solutions; and iii) access to finance and appropriated policies for green innovation in Africa. Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu).</p>
	<p>FIUWA project addresses the questions of existing challenges and needs in the water sector in the region (water supply, water use efficiency, etc.), specific/potential interventions required to address the challenges (technology, policy interventions, etc.), and what role digital/frontiers technologies (IoT, AI, big/smart data, crowd sensing, etc.) can play and how can they be adopted/adapted, jointly with German actors to support frugal innovation, job creation to leapfrog water sector in SAR and inspire youth entrepreneurship. The project borrows from and builds on the recent success of frugal innovations and youth entrepreneurship in the mobile sector in Africa. Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu)</p>
	<p>In order to overcome data scarce conditions, within the AquaMount activities we have been applying or a going to apply a mixed-method approach combining: (i) semi structured interviews, to explore historic water scarcity events and current access issues, (ii) machine-learning supported Earth Observation analysis, to estimate the population density of informal settlements requiring access to water, and (iii) climate and hydrologic data, to analyse historical conditions of water availability using - amongst others- system dynamic modelling. The combination of these methods allowed us to extract narratives on social dynamics while describing the biophysical conditions that led to recent water scarcity impacts. Contact persons: Dr. Schneiderbauer Stefan (email:schneiderbauer@ehs.unu.edu), Ms. Jess Delves (delves@ehs.unu.edu) and Dr Stefano Terzi (terzi@ehs.unu.edu).</p>

	<p>There is no specific example related to the above challenge for the APV-MaGa project, however, the key role of United Nations University – Institute for Environment and Human Security (UNU-EHS) is to conduct research and develop solutions that contribute and ensure the use of water in an efficient, sustainable and integrated manner within the agrophotovoltaic system and the surrounding environment. An intelligent systems based on smart sensors, microcontrollers respectively Internet of Things will be designed to monitor and collect real time data for water demand and water allocation for irrigation systems. Furthermore, UNU-EHS will support in the development of a web-access in order to provide information on agricultural products and organized payment for various services offer to the community. Contact person: Dr Ambe Emmanuel Cheo (email: cheo@vie.unu.edu)</p>
<p>3. Can you provide examples of policies/projects/initiatives specifically aimed at strengthening national STI capabilities to address these challenges?</p>	<p>FIUWA project consist of a virtual environment with appropriated courses to strengthen entrepreneurial and hard skills of youths and women in the selected green sectors, a blueprint and a technical implementation of a reference virtual Incubator and accelerator at Pan African level with appropriated services such as mentoring, networking, infrastructure and resources, seed funding, etc. A community of practice around the topic of green innovation and Entrepreneurship in Africa, a Pan African Green Entrepreneurship Policy and Knowledge Hub will be established to analyse the interactions among stakeholders of the innovation and entrepreneurship ecosystem and provide policy and recommendations for the improvement of the ecosystem. Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu)</p>

FIUWA project will define and implement a capacity/skills development process necessary to build innovative and entrepreneurial skills of promising youths/young innovators in Southern Africa. To address the challenge of seed funding, FIUWA seeks to integrate business angel networks and venture capitalists on the continent into the innovation ecosystem to link them with innovators at an early stage, with a hope that some innovations will attract the attention of these potential funders. Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu)

The AquaMount project currently focused on the QwaQwa region, the social, political, economic and historic settings are common across all of South Africa, where many other regions are also experiencing similar issues of water scarcity and access. Therefore, the methods developed through our activities, together with our results, are of relevance at a national scale insofar as they can be applied in areas facing similar challenges. To this end, we are establishing a Water Research Network with international scientists to share resources and knowledge to tackle the issue of water scarcity in QwaQwa and improve its resilience to future climate and anthropogenic changes.

Moreover, the project is carrying out activities with the local university (University of the Free State - UFS) to support their technical and academic capacity building. the project has been collecting historical water scarcity and drought information data to fill the gap of quantitative drought impact data and improve the knowledge of its complex impacts across multiple sectors. Furthermore, the project collaborates with the Geography department at UFS Qwa-qwa campus in the use of remote sensing images for mapping informal settlements in order to improve the mapping techniques with local information. Contact persons: Dr. Schneiderbauer Stefan (email:schneiderbauer@ehs.unu.edu), Ms. Jess Delves (delves@ehs.unu.edu) and Dr Stefano Terzi (terzi@ehs.unu.edu).

	<p>The APV-MaGa project will involve Group of Women, Group of Farmers, local municipalities and private company from the beginning of the project to ensure ownership as well as build their capacity since they will be responsible in selling services to the community using digital solutions, such as Pay-As-You-Go (PAYGo) systems. Additionally, microfinance institutions, agricultural banks and insurance companies will be approached to partner with the community companies in order to offer additional services to the end-users, beneficiaries, and customers thus helping in commercialization of the project results. Furthermore, the result of the project will provide a solid ground for the development of APV as a marketable product that protects the environment and contributes to the improvement of people's livelihood. Contact person: Dr Ambe Emmanuel Cheo (email: cheo@vie.unu.edu)</p>
<p>4. Could you share case studies of regional/ international cooperation that have strengthened STI developing countries' capacities in managing water and sanitation and improve their access for all?</p>	<p>For the YW-GSE project, UNU-EHS coordinates a consortium of partners including Pan African University Institute for Water and Energy Sciences (incl. Climate Change – PAUWES) Algeria, AfriLabs, Venture Capitals for Africa (VC4A) and United Nations Framework Convention on Climate Change Secretariat (UNFCCC). Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu)</p> <p>Within the FIUWA project, UNU-EHS is partnering with several national and continental institutions which includes African Water Association, AUDA-NEPAD SANWATCE, AfriLabs and TechHubs, Germany Water Partnership (GWP), Fraunhofer Center for International Management and Knowledge Economy IMW. Contact Person: Dr. Erick Tambo (email: tambo@vie.unu.edu)</p> <p>For the AquaMount project, the ongoing collaboration between GLOMOS and the AfriMontane Research Unit (ARU) of the UFS consists of multiple research activities, involving joint lectures, workshops and publications. Contact persons: Dr.</p>



	<p>Schneiderbauer Stefan (email:schneiderbauer@ehs.unu.edu), Ms. Jess Delves (delves@ehs.unu.edu) and Dr Stefano Terzi (terzi@ehs.unu.edu).</p>
	<p>APV-MaGa projects builds on an international consortium of partners from Germany, The Gambia, Mali and WASCAL network, which covers 10 West African countries in the area of climate change adaptation, mitigation sustainable energy supply and land management. This includes: Fraunhofer Institute for Solar Energy Systems Freiburg, deea solutions GmbH Frankfurt am Main, University of Freiburg and partners from Mali and The Gambia: Rural Polytechnic Institute of Training and Applied Research of Katibougou, Mali, Malian Awakening Association for Sustainable Development, West African Science Service Center on Climate Change and Adapted Land Use – (WASCAL) both in the Gambia and Mali, Ministry of Secondary, Food and Agriculture Organization of the United Nations Technical Office (FAO Gambia), National Agricultural Research Institute, Nadji.Bi Ltd Gambia and Mali-FolkeCenter Nyetaa. Contact person: Dr Ambe Emmanuel Cheo (email: cheo@vie.unu.edu)</p>
	<p>In the RETO-DOSSO project, UNU-EHS is partnering with several African and German institutions including PAUWES, WASCAL-UAM, ZEF, ITT, TUM, etc. This partnership facilitates the sharing of knowledge and experiences among partner insitutions which enhances capacities of all individuals and institutions involved. Contact person: Mr. Paul Nduhuura (email: Nduhuura@vie.unu.edu)</p>